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Wallace

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[54] **FLOATING INSULATOR TOP FOR PALLET SIZED CONTAINER**

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Related U.S. Application Data

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[51] **Int. Cl.**[6] **F25D 3/08**

[52] **U.S. Cl.** **62/371**

[58] **Field of Search** 62/457.1, 457.2, 62/457.7, 529, 530, 371; 220/578, 579

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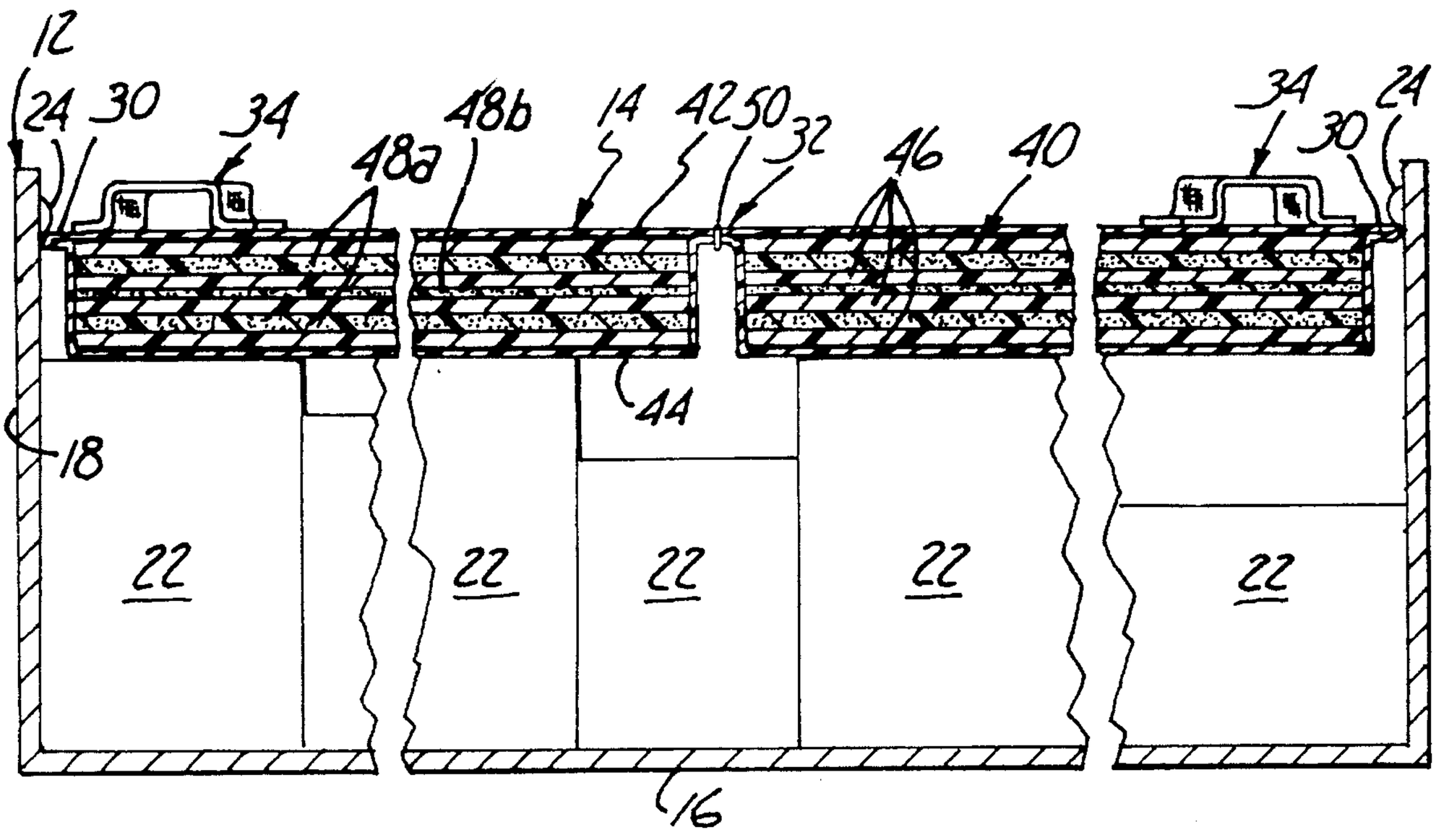
[57] **ABSTRACT**

An insulated container system includes a container and a cover. The container has a base and side walls which define an inner cavity. The cover slidably moves within the inner cavity of the container. The cover includes an insulating central core and a sealing flap surrounding the central core.

20 Claims, 1 Drawing Sheet



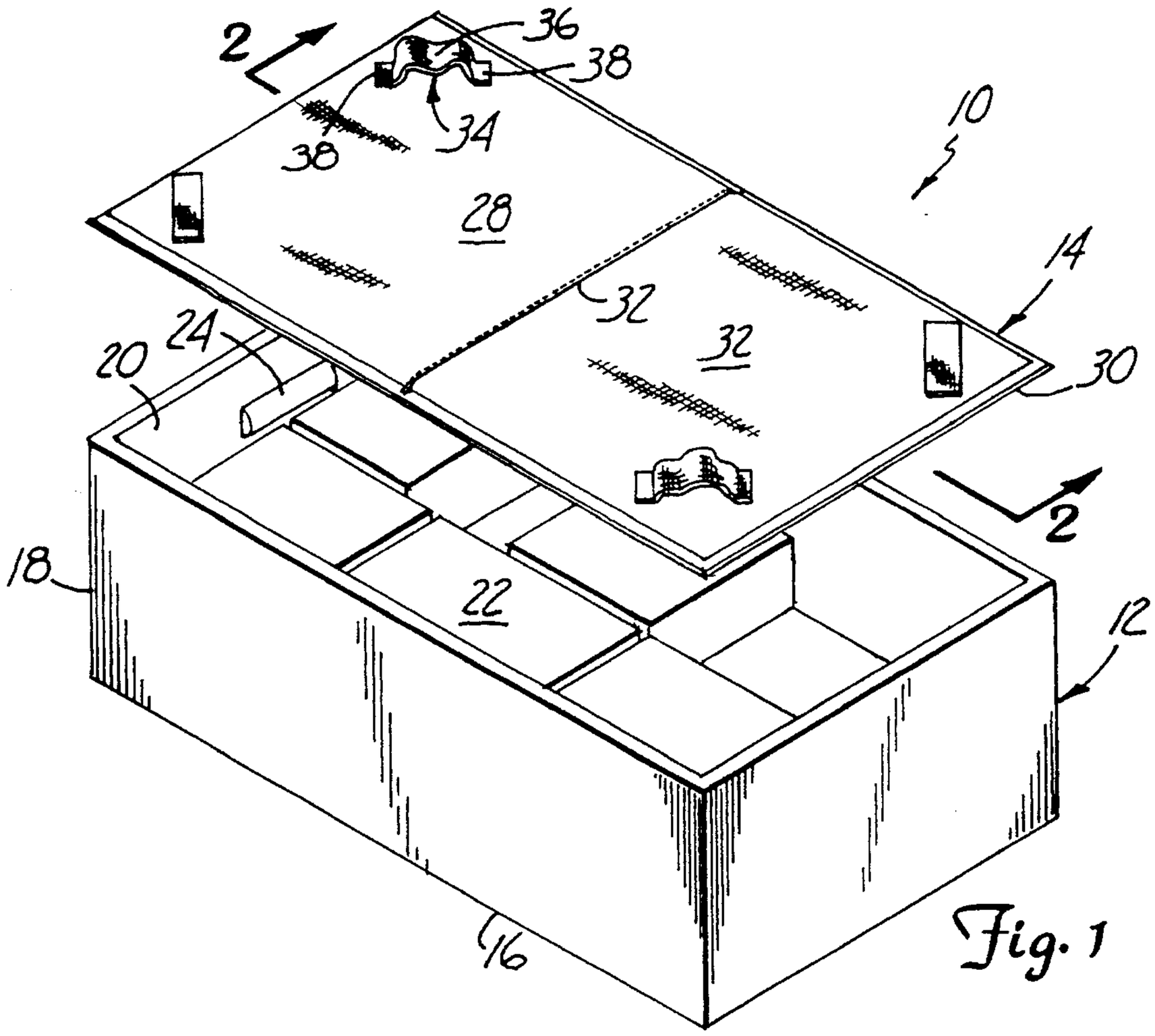

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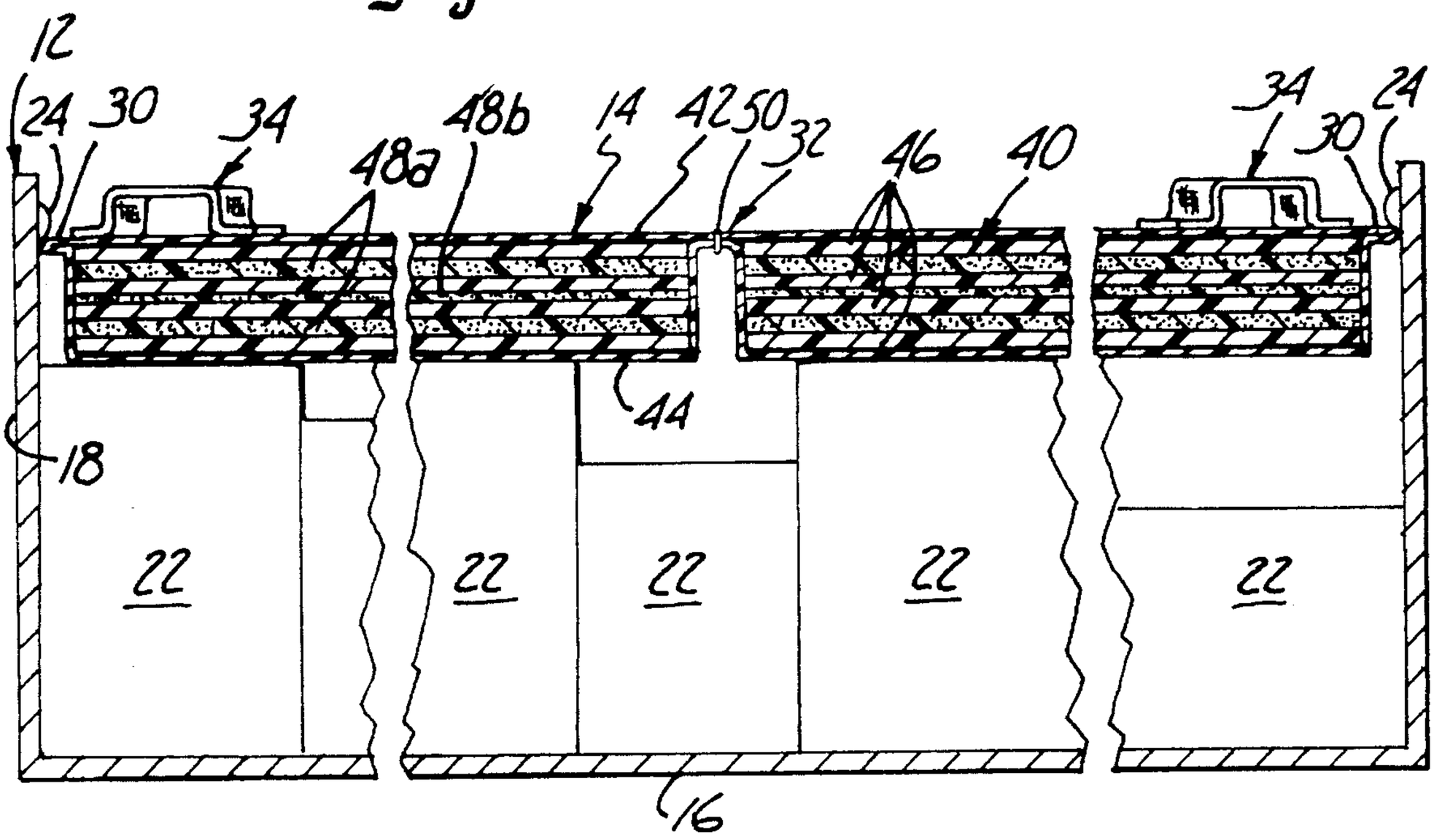
Fig. 1

Fig. 2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FLOATING INSULATOR TOP FOR PALLET SIZED CONTAINER

This is a continuation of application Ser. No. 08/120,162, filed Sept. 10, 1993.

BACKGROUND OF THE INVENTION

The present invention relates to insulated containers for the storage and transport of frozen, fresh, chilled or processed foods and other perishable or temperature sensitive products or materials. In particular, the invention relates to an insulated container having a cover for slidably moving within the inner cavity of the container.

During the transport and storage of frozen, fresh, chilled or processed foods, such as seafood, bakery, candy, ice and other perishable or temperature sensitive products or materials, it is essential that the goods be kept at a prescribed storing temperature. To transport large volumes of temperature sensitive goods, refrigerator vans with individual freezing systems have been used. However, transport of small amounts of goods to one or a few retailers or consumers with a refrigerator van is expensive and slow. Because of high freight costs, many frozen goods are transported on conventional vehicles which leads to quality losses and damaged goods.

To maintain temperature sensitive goods at the prescribed storing temperature without the use of an external power source, insulated containers or chests have been utilized for the transport and storage of the temperature sensitive goods. To allow easy filling of the insulated containers and to prevent heat or cold loss, insulated containers have included an insulated cover or top which fits above or is supported by the side walls of the container.

Insulated containers with side wall suspended tops have several drawbacks. Because the top is supported by the top edges of the side walls, the position of the top on the container is permanently fixed. If the temperature sensitive goods do not fill the insulated container, a dead air space is created between the temperature sensitive goods and the top of the insulated container. This dead air space acquires an equilibrium temperature with the adjacent temperature sensitive goods. As this happens, previously chilled goods warm up and previously heated goods cool down. Moreover, this additional air space must also be insulated. As a result, the insulating efficiency of the insulating container is reduced.

In addition, because the top of the container is supported by the side walls, the side walls must be strong enough to support the weight of the top as well as any other containers which are place on top of the container. To meet this strength requirement, the side walls must either be constructed of a stronger, more expensive material or be made thicker to accommodate the additional weight. As a result, these high strength side walls either increase the cost of the container or, in the alternative, reduce the storage capacity of the container.

SUMMARY OF THE INVENTION

The present invention is an insulated container system for frozen, fresh, chilled or processed foods and other perishable or temperature sensitive goods. The insulated container system includes a container and a cover. The container includes a base and side walls which define an inner cavity. The cover slidably moves within the inner cavity of the container. The cover includes an insulating central core, a flap which surrounds the central core, and a protective layer covering the central core and the flap.

After temperature sensitive goods have been placed within the inner cavity of the container, the cover or top is inserted into the inner cavity of the container. The cover is then forced downward until a bottom of the cover meets the temperature sensitive goods. The flap provides a seal between the cover and the side walls of the container. At the same time, the volume of dead air space between the cover and the temperature sensitive goods is minimized. Consequently, there is less dead air space to insulate. In addition, because the weight of the side wall is not supported by the side walls, the side walls may be constructed using thinner, less expensive material. The insulated container of the present invention achieves greater insulating efficiencies at a lower cost.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a perspective view of a free floating containment system including a container and a cover.

FIG. **2** is a cross-sectional view of the containment system of FIG. **1** showing the cover slidably positioned within the container.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

FIG. **1** shows a perspective view of a free floating insulating containment system **10** for storing and transporting frozen, fresh, chilled or processed foods, or other perishable or temperature sensitive goods. Containment system **10** is preferably pallet sized for storing and shipping large quantities of temperature sensitive goods. Containment system **10** generally includes container **12** and top or cover **14**. Container **12** is preferably formed from blow molded and thermoformed high density polyethylene. Container **12** includes base **16** and side walls **18**. Side walls **18** generally consist of four panels coupled to base **16**. Thus, container **12** is preferably rectangular so as to be easily stacked within transportation vehicles. However, as can be appreciated, container **12** may be formed from a variety of materials and may have a variety of shapes. Side walls **18** are preferably collapsible for ease of storage and transport when not in use. Side walls **18** and base **16** define an inner cavity **20** for receiving and holding products or goods **22**. Each side wall **18** further includes protruding edge **24**.

Protruding edge **24** is preferably integrally formed with each side wall **18**. Alternatively, protruding edge **24** may be fixedly secured to side wall **18**. Protruding edge **24** protrudes from inner surface **26** of side walls **18** into inner cavity **20**. Protruding edge **24** is preferably positioned equidistant from adjacent side walls **18**. Protruding edge **24** extends into inner cavity **20** at a distance sufficient so as to prevent cover **14** from accidentally falling out of inner cavity **20** of container **12**.

In a preferred embodiment, container **12** is blow molded and thermoformed from a plastic so as to be large enough to hold large quantities of goods, yet light enough so as to reduce shipping costs. In a loaded condition, container **12** preferably has an external length of about 48 inches, an external width of about 45 inches, and an external heighth of about 34 inches. When collapsed, the external heighth of container **12** is reduced to approximately 12 inches. Inner cavity **20** is preferably about 45 inches in length, 42 inches in width and 29 inches in heighth. As a result, container **12** preferably has storage capacity up to 237.2 gallons.

Cover **14** is shaped so as to slidably move within inner cavity **20** of container **12**. Cover **14** includes central portion **28**, flaps **30**, hinge **32** and handles **34**. Central portion **28** has outer dimensions which are slightly smaller than the inner dimensions of inner cavity **20** so that central portion **28** of cover **14** may be slidably moved within inner cavity **20**. As a result, cover **14** may be placed within inner cavity **20** of container **12** adjacent to and above goods **22**. Consequently, dead air space between goods **22** and cover **14** is eliminated or minimized. By reducing or eliminating dead air space, container system **10** more efficiently insulates goods **22**.

In addition, because cover **14** is not supported by side walls **18**, side walls **18** may be constructed of a weaker, less expensive, more lightweight material. Because side walls **18** do not need to support cover **14**, side walls **18** may be made thinner, thereby reducing the size of container **12** and increasing the storage capacity of container system **10**.

Flaps **30** extend around a perimeter of central portion **28**. Flaps **30** preferably extend approximately 1 inch outward from central portion **28**. Preferably, flaps **30** have a shape similar to the diameter of inner cavity **20**. In addition, flaps **30** preferably have a thickness of about 1/16 of an inch and have a low level of flexibility so that when cover **14** is positioned within inner cavity **20** of container **12**, flaps **30** provide a relatively airtight seal between cover **14** and side walls **18** of container **12**. This airtight seal further protects temperature sensitive goods **22**. Alternatively, other sealing mechanisms may be used along the perimeter of central portion **28**, for example, foam rods or gel packs.

Hinge **32** preferably comprises a stitched seam across central portion **28**. Alternatively, other hinge mechanisms may be employed. Hinge **32** permits cover **14** to be partially lifted and folded over upon itself. As a result, temperature sensitive goods **22** may be easily accessed without entire cover **14** needing to lifted and removed. Moreover, because only a portion of cover **14** needs to be lifted or removed to access a particular temperature sensitive good **22**, temperature sensitive goods **22** beneath the unlifted portion of cover **14** remain covered and protected.

Handles **34** are preferably positioned at each of four corners of cover **14**. Handles **34** permit at least a portion of cover **14** to be lifted out of inner cavity **20** of container **12**. Handles **34** preferably are made of rectangular strips **36**. Strips **36** are preferably made from nylon and are fixedly secured to central portion **28** at opposite ends **38**. Nylon strips **36** are preferably heat sealed to central portion **28** at opposite ends **38**. As nylon strips **36** are heated, strips **36** become fused to central portion **28** to create a dielectric seal. Alternatively, strips **36** may be secured to central portion **28** by other means such as glue, stitching, staples or bolts. Because handles **34** are preferably formed from nylon strips **36**, handles **34** are thin, lightweight and easy to manufacture and affix. Because nylon strips **36** are preferably heat sealed to central portion **28**, handles **34** do not include any sharp, rigid components which may puncture and damage temperature sensitive goods **22** or cover **14**.

In the preferred embodiment, cover **14** preferably has a length of about 45 inches, a width of about 42 inches and a heighth of about 3 inches. Central portion **28**, which is defined by insulating core **40**, preferably has a length from between about 44½ to about 45 inches and a width from between about 41½ to about 42 inches. Consequently, cover **14** slidably fits within container **12**. Because cover **14** is preferably 3 inches thick, cover **14** stores within container **12** when side walls **18** are collapsed.

FIG. **2** shows a cross-sectional view of cover **14** slidably positioned within container **12** above temperature sensitive goods **22**. FIG. **2** shows the construction of cover **14** in greater detail. As best shown by FIG. **2**, cover **14** includes insulating core **40**, top protective layer **42** and bottom protective layer **44**. Insulating core **40** defines central portion **28** and preferably has a thickness of about 3 inches so that cover **14** may be nested within cavity **20** when side walls **18** are collapsed. As a result, cover **14** is easily stored and transported when containment system **10** is not being used.

Insulating core **40** comprises at least one sheet or layer of insulating material. Insulating core **40** preferably includes four alternating polyurethane sheets **46** and three alternating urethane foam sheets **48***a*,**48***b*. Polyurethane sheets **46** and urethane foam sheets **48***a* each preferably have a thickness of about 7/16 of an inch. Urethane foam sheet **46***b* is centered within insulating core **40** and preferably has a thickness of about 5/16 of an inch. Polyurethane sheets **46** and urethane foam sheets **48***a*,**48***b* are preferably held together by top protective layer **42** and bottom protective layer **44**. Alternatively, polyurethane sheets **46** and urethane foam sheets **48** may be laminated together. Polyurethane sheets **46** and urethane foam sheets **48** insulate temperature sensitive goods **22** below cover **14**. Because polyurethane sheets **46** and urethane foam sheets **48** are alternated, insulating core **40** better insulates cavity **16** and is more flexible and durable. Consequently, insulating core **40** is better able to withstand shock and vibration. In addition, because insulating core **40** is formed from polyurethane and urethane, materials approved by the FDA, accidental contact between insulating core **40** and food articles will not render the food articles inedible. Alternatively, insulating core **40** may be constructed from a variety of insulating materials.

Top protective layer **42** and bottom protective layer **44** surround and enclose insulating central core **40** so as to protect core **40** from moisture and puncture damage. Top protective layer **42** and bottom protective layer **44** are preferably formed from sheets of **18** ounce reinforced vinyl. Alternatively, top protective layer **42** and bottom protective layer **44** may be formed from a variety of materials or coatings such as Hypalon, by Dupont.

Top protective layer **42** and bottom protective layer **44** preferably have dimensions which are larger than the dimensions of central insulating core **40** so as to allow top protective layer **42** and bottom protective layer **44** to overlap one another around the perimeter of central insulating core **40**. Top protective layer **42** and bottom protective layer **44** are preferably heat sealed around the perimeter of central insulating core **40** to form flaps **30**. Upon being heated, top protective layer **42** and bottom protection layer **44** partially melt to become fused together and to form an airtight, water resistant seal between the layers. Alternatively, top protective layer **42** may be coupled to bottom protective layer **44** by stitches, glue or various other means. Top protective layer **42** is also preferably secured to bottom protective layer **44** along a line across central portion **28** to form hinge **32**. Top protective layer **42** is preferably stitched to bottom protective layer **44** with waterproof thread **50**, such as nylon.

Upon being assembled together, insulating core **40**, top protective layer **42** and bottom protective layer **44** have an insulating R factor of greater than about 7. However, as can be appreciated, the thickness of insulating core **40** may be increased to increase the insulating effect of cover **12**. For example, increasing the thickness of core **40** by 1 inch increases the R factor to greater than about 10.

In conclusion, free floating insulating containment system **10** is an improved system for storing and transporting

perishable or temperature sensitive goods. Because cover **14** is formed from lightweight, inexpensive insulating sheets of material which are held together and protected by vinyl sheets, cover **14** is lightweight, durable, inexpensive and easy to manufacture. Because cover **14** is lightweight, cover **14** may be slidably disposed within container **12** to rest above the temperature sensitive goods. Consequently, dead air space between the temperature sensitive goods and cover **14** is eliminated or minimized. By reducing or eliminating dead air space, container system **10** more efficiently insulates goods **22**. Moreover, because cover **14** is not supported by side walls **18**, side walls **18** may be constructed of a weaker, less expensive, more lightweight material. Thus, side walls **18** may be made thinner to reduce the size of container **12** and to increase the storage capacity of container system **10**.

Other features of containment system **10** further improve the storage and transport of temperature sensitive goods. Because cover **14** includes handles **34** which are formed from nylon strips, cover **14** may be easily and quickly lifted from within cavity **20** of container **12**. In addition, the nylon strips which form handles **34** are thin, lightweight and easy to manufacture and affix to cover **14**. Because the nylon strips which form handles **34** are preferably heat sealed to cover **14**, handles **34** do not include any sharp, rigid components which may puncture and damage temperature sensitive goods or cover **14**. Because flaps **30** form a relatively airtight seal between cover **14** and container **12**, flaps **30** further protect and insulate the temperature sensitive goods. Hinge **32** permits cover **14** to be partially lifted and folded over upon itself. As a result, only a portion of cover **14** needs to be lifted or removed to access a particular temperature sensitive good. Thus, temperature sensitive goods beneath the unlifted portion of cover **14** remain covered and protected. At the same time, protruding edge **24** prevents cover **14** from accidentally falling out of inner cavity **20** of container **12**. Insulating containment system **10** provides an effective, lightweight and economical system for storing and transporting perishable and temperature sensitive goods.

Although the present invention has been described with reference to preferred embodiments, workers skilled in the art will recognize that changes may be made in form and detail without departing from the spirit and scope of the invention.

What is claimed is:

1. An insulated container system comprising:

a container having a base and side walls which define an inner cavity; and

a cover for slidably moving within the inner cavity of the container, the cover comprising:

a lightweight foam core having a perimeter including a plurality of alternating layers of urethane foam and polyethylene for insulating the inner cavity; and

sealing means along the perimeter of the foam core for scaling between the cover and the container.

2. The system of claim **1** wherein the foam core is surrounded by a protective layer.

3. The system of claim **2** wherein the protective layer comprises vinyl.

4. The system of claim **1** wherein the sealing means comprises a flap along an outer perimeter of the cover so that upon insertion of the cover into the inner cavity of the container, the flap is slightly compressed against the side walls of the container to form a seal between the cover and the side walls.

5. The system of claim **3** wherein at least two opposite side walls each include a protruding edge which protrudes into the inner cavity near a top edge of each side wall so as to prevent the cover from accidentally falling out of the inner cavity of the container.

6. The system of claim **1** wherein the cover further includes a hinge so that a portion of the cover may be lifted.

7. The system of claim **1** wherein the cover comprises at least one handle on a top side of the cover.

8. The system of claim **7** wherein at least one handle comprises a nylon strip coupled to the top side of the cover.

9. An insulated container system comprising:

a container having a base and side walls connected to the base which define an inner cavity of the container and an opening; and

a cover for insulating the inner cavity, the cover comprising:

a relatively rigid insulated portion sized similar to the opening of the container; and

a sealing portion formed of a flexible material and extending about the perimeter of the rigid portion, said sealing portion being sized so that the combined rigid portion and sealing portion define a cover which is sized larger than the opening of the container to provide a frictional fit between the cover and the side walls of the container, the flexible material of the sealing portion permitting the cover to be slidably adjusted within the inner cavity of the container.

10. The insulated container system of claim **9** wherein the sealing portion of the cover includes flaps extending about a periphery of said cover, said rigid insulated portion having a first thickness and said flaps having a second thickness, the second thickness being smaller than the first thickness so that the flaps may deform to fit the cover within the opening of the container.

11. The insulated container system of claim **9** and further including a stop mechanism within the inner cavity of the container, said stop mechanism being designed to restrict slidable movement of the cover within the inner cavity at the opening to the inner cavity.

12. The insulated container system of claim **11** wherein the stop mechanism comprises a plurality of spaced protruding edges mounted on the side walls within the inner cavity at the opening of the container.

13. The insulated container system of claim **9** wherein the rigid portion of the cover includes:

a first base portion and a second base portion; and

a hinge for hingedly connecting the first base portion to the second base portion for providing selective access to portions of the inner cavity of the container.

14. The insulated container system of claim **13** wherein the first and second base portions includes handles.

15. The insulated container system of claim **9** wherein the rigid portion of the cover includes a handle.

16. The insulated container system of claim **10** wherein the flaps are formed by first and second protective layers covering the upper and lower surfaces of the insulated base portion and extending therebeyond and, connected along a periphery of the insulated base portion to enclose the insulated base portion and form the flaps.

17. The insulated container system of claim **9** wherein the rigid insulated portion is formed of alternating layers of urethane foam and polyethylene.

18. The insulated container system of claim **16** wherein the first and second protective layers are vinyl.

19. The insulated container system of claim **16** wherein the first and second protective layers are connected by a heat seal.

20. An insulated container system comprising:

a container having a base and sidewalls connected to the base which define an inner cavity of the container and an opening; and

a cover for insulating the inner cavity, the cover comprising:

a relatively rigid insulated portion sized similar to the opening of the container; and

a sealing portion including flaps extending about a periphery of said cover, said rigid insulated portion having a first thickness and said flaps having a second thickness, the second thickness being smaller than the first thickness to define relatively flexible flaps so that the flaps may deform to fit the cover within the opening of the container.

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